

INVENTOR: SANGHA, Jangbir  
TITLE: METHOD AND APPARATUS OF DNA COLLECTION

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## CLAIMS

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is as follows:

1. A kit for the collection of material containing DNA comprising :  
a housing containing at least one collection device for collecting material containing DNA, and  
a treatment applied to said housing containing said at least one material collection device.
2. The kit as claimed in claim 1 wherein said housing containing said device is treated with an effective quantity of an agent for disabling DNA from interfering with subsequent specimen specific DNA analysis.
3. The kit as claimed in claim 2 wherein said agent comprises exposure to gamma radiation.
4. The kit as claimed in claim 2 wherein said agent comprises exposure to ethylene oxide.
5. The kit as claimed in claim 2 wherein said agent comprises exposure to an ion beam.
6. The kit as claimed in claim 2 wherein said agent comprises exposure to electron beam ionization.

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1 7. A method of preventing contamination of a kit for collection of material containing  
2 DNA, the contamination being the presence of DNA on kit components prior to  
3 collection of a DNA sample, the method comprising the steps of:

4 placing the kit components within a housing,  
5 exposing said housing containing said kit components to an effective quantity of  
6 an agent for disabling DNA from interfering with subsequent specimen  
7 specific DNA analysis.

8 8. The method as claimed in claim 7 wherein said exposing step comprises  
9 exposure to gamma radiation.

10 9. The method as claimed in claim 7 wherein said exposing step comprises  
11 exposure to ethylene oxide.

12 10. The method as claimed in claim 7 wherein said exposing step comprises  
13 exposure to an ion beam.

14 11. The method as claimed in claim 7 wherein said exposing step comprises  
15 exposure to an electron beam ionization.

16 12. A method for collection of DNA-containing material from the surface of the skin  
17 of a subject comprising:

18 contacting a collecting surface of a collection device with the skin of the subject,  
19 and  
20 collecting DNA-containing material of the subject.

21 13. The method as claimed in claim 12 wherein said collecting surface is treated with  
22 a wetting agent.

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14. The method as claimed in claim 12 wherein said collection device contacts the skin of the subject at the base of the nose of the subject.

15. The method as claimed in claim 12 wherein said collection device contacts the skin of the subject behind the ear of the subject.

16. The method as claimed in claim 12 further comprising the step of obtaining said collection device from a kit, said kit having been exposed to effective quantity of an agent for disabling DNA from interfering with subsequent specimen specific DNA analysis.

17. The method as claimed in claim 16 wherein said agent is gamma radiation.

18. The method as claimed in claim 16 wherein said agent is ethylene oxide.

19. The method as claimed in claim 16 wherein said agent is an ion beam.

20. The method as claimed in claim 16 wherein said agent is an electron beam ionization.

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21. A method for collection of DNA-containing material from the surface of the skin of a subject comprising:

assembling into a housing, a kit having at least one device for collection of DNA-containing material from the surface of the skin,  
exposing said housing containing said kit to an effective quantity of an agent for disabling DNA from interfering with subsequent specimen specific DNA analysis,  
rubbing a collection device from said kit on the skin of the subject, and  
collecting DNA-containing material from the subject.

22. The method as claimed in claim 21 wherein said agent is gamma radiation.

23. The method as claimed in claim 21 wherein said agent is ethylene oxide.

24. The method as claimed in claim 21 wherein said agent is an ion beam.

25. The method as claimed in claim 21 wherein said agent is an electron beam ionization.

26. A device for selective collection from one of two adjacent surfaces of a subject's body of material containing DNA comprising :

a device for collecting material containing DNA said device having a collection portion, said collection portion having a front surface and a rear surface, said rear surface having a covering thereon to prevent collection of material containing DNA and said front surface is available for collection of material containing DNA.

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- 1 27. The device as claimed in claim 26 wherein said material is comprised of  
2 epithelial cells.
- 3 28. The device as claimed in claim 26 wherein said material is comprised of cheek  
4 cells.
- 5 29. The device as claimed in claim 26 wherein said material is comprised of tongue  
6 cells.
- 7 30. The device as claimed in claim 26 further comprising a treated housing for  
8 holding said device, said housing being treated after said housing is filled with said  
9 device.
- 10 31. The device as claimed in claim 23 wherein said housing is treated with an  
11 effective quantity of an agent an effective quantity of an agent for disabling DNA from  
12 interfering with subsequent specimen specific DNA analysis.
- 13 32. The device as claimed in claim 31 wherein said agent is gamma radiation.
- 14 33. The device as claimed in claim 31 wherein said agent is to ethylene oxide.
- 15 34. The device as claimed in claim 31 wherein said agent is an ion beam.
- 16 35. The device as claimed in claim 31 wherein said agent is an electron beam  
17 ionization.

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1 36. A device for collection of material containing DNA from the surface of a the  
2 cheek within the mouth while avoiding collection of material containing DNA from the  
3 tongue, gums or teeth, the device comprising:

4 a collection portion, said collection portion having a front surface and a rear  
5 surface, said rear surface having a covering thereon to prevent collection  
6 of material containing DNA from the tongue and said front surface is  
7 available for contacting the inside of the subject's cheek for collection of  
8 material containing DNA.

9 37. The device as claimed in claim 36 wherein prior to use said device is contained  
10 within a treated housing, said housing having been treated with an effective quantity of  
11 an agent for disabling DNA from interfering with subsequent specimen specific DNA  
12 analysis

13 38. A device for collection of material containing DNA from the surface of a the  
14 tongue while avoiding collection of material containing DNA from the adjacent mouth  
15 tissue, the device comprising:

16 a collection portion, said collection portion having a front surface and a rear  
17 surface, said rear surface having a covering thereon to prevent collection  
18 of material containing DNA from mouth tissue adjacent to the tongue and  
19 said front surface is available for contacting the subject's tongue for  
20 collection of material containing DNA.

21 39. The device as claimed in claim 38 wherein prior to use said device is contained  
22 within a treated housing, said housing having been treated with an effective quantity of  
23 an agent for disabling DNA from interfering with subsequent specimen specific DNA  
24 analysis.

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1 40. A method of collecting material containing DNA from a subject comprising the  
2 steps of:

3 placing a device for collecting material containing DNA within a housing,  
4 exposing said housing and said device placed in said housing to an effective  
5 quantity of an agent for disabling DNA from interfering with subsequent  
6 specimen specific DNA analysis,  
7 restraining the subject; and  
8 wiping said device on the skin of the subject.

9 41. The method as claimed in claim 40 wherein said exposing step comprises  
10 exposure to gamma radiation.

11 42. The method as claimed in claim 40 wherein said exposing step comprises  
12 exposure to ethylene oxide.

13 43. The method as claimed in claim 40 wherein said exposing step comprises  
14 exposure to an ion beam.

15 44. The method as claimed in claim 40 wherein said exposing step comprises  
16 exposure to electron beam ionization.

17 45. The method as claimed in claim 40 wherein said wiping step is performed on the  
18 skin behind the ear of the subject.

19 46. The method as claimed in claim 45 wherein said wiping step further comprising  
20 the step of approaching a subject from behind to perform said wiping step.

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1 47. A kit for the collection of DNA from a subject comprising a holder containing a  
2 sample collection substrate said holder having a plurality of voids therein providing  
3 access to said substrate to allow skin cells scraped from the subject to pass through  
4 said voids for capture on said paper.

5  
6 48. The kit as claimed in claim 47 wherein said substrate is placed into a housing  
7 and said housing containing said substrate is exposed to an effective quantity of an  
8 agent for disabling DNA from interfering with subsequent specimen specific DNA  
9 analysis.

10 49. The kit as claimed in claim 48 wherein said agent comprises exposure to gamma  
radiation.

11 50. The kit as claimed in claim 48 wherein said agent comprises exposure to  
ethylene oxide.

12 51. The kit as claimed in claim 48 wherein said agent comprises exposure to an ion  
beam.

13 52. The kit as claimed in claim 48 wherein said agent comprises exposure to  
electron beam ionization.

14 53. The kit as claimed in claim 48 further comprising sealing means for covering said  
15 voids after use.

16 54. The kit as claimed in claim 47 wherein said substrate is comprised of material  
17 selected from the group consisting of Whatman FTA, S&S IsoCode, S&S 903, and  
18 S&S 900.  
19  
20  
21  
22



1 55. The kit as claimed in claim 47 wherein said substrate is comprised of an  
2 adhesive material applied to the surface of said substrate.

3 56. A kit for the collection of DNA from a subject comprising  
4 a tubular holder containing a sample collection portion, and  
5 a retraction mechanism connecting said sample portion to said holder, said retraction  
6 mechanism allowing said portion to be extended from said holder for sample  
7 collection and said retraction mechanism allowing said portion to be retracted  
8 into said holder for sample storage.

9 57. The kit as claimed in claim 56 wherein said holder containing said sample portion  
10 is placed into a housing and said housing containing said paper is exposed to an  
11 effective quantity of an agent for disabling DNA from interfering with subsequent  
12 specimen specific DNA analysis.

13 58. The kit as claimed in claim 57 wherein said agent comprises exposure to gamma  
14 radiation.

15 59. The kit as claimed in claim 57 wherein said agent comprises exposure to  
16 ethylene oxide.

17 60. The kit as claimed in claim 57 wherein said agent comprises exposure to an ion  
18 beam.

19 61. The kit as claimed in claim 57 wherein said agent comprises exposure to  
20 electron beam ionization.

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62. The kit as claimed in claim 56 wherein said sample portion is comprised of material selected from the group consisting of Dacron, nylon, plastic, cotton, and paper.

63. The kit as claimed in claim 56 wherein said sample portion is comprised of an adhesive surface.

64. The kit as claimed in claim 63 wherein the adhesive strength of said adhesive surface is variable.

65. The kit as claimed in claim 56 wherein said sample portion is comprised of material selected from the group consisting of Whatman FTA, S&S IsoCode, S&S 903, and S&S 900.

66. A kit for the collection of DNA from a subject comprising a sample collection substrate for collection of DNA from a subject thereon, said substrate having a first side and a second side.  
said substrate having a protective layer on said first side to limit contamination of said first side, and  
said substrate having a second protective layer attached to a portion of said second side said second protective layer being foldable over said second side to prevent contamination of said second side.

67. The kit as claimed in claim 66 wherein said sample collection substrate is placed into a housing and said housing containing said substrate is exposed to an effective quantity of an agent for disabling DNA from interfering with subsequent specimen specific DNA analysis.

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68. The kit as claimed in claim 67 wherein said agent comprises exposure to gamma radiation.

69. The kit as claimed in claim 67 wherein said agent comprises exposure to ethylene oxide.

70. The kit as claimed in claim 67 wherein said agent comprises exposure to an ion beam.

71. The kit as claimed in claim 67 wherein said agent comprises exposure to electron beam ionization.

72. The kit as claimed in claim 66 wherein said substrate is comprised of material selected from the group consisting of Whatman FTA, S&S IsoCode, S&S 903, and S&S 900.

73. The kit as claimed in claim 66 wherein said sample portion is comprised of material selected from the group consisting of Dacron, nylon, plastic, cotton, and paper.

74. The kit as claimed in claim 66 wherein said sample portion is comprised of an adhesive surface.

75. The kit as claimed in claim 74 wherein said adhesion properties of said adhesive surface are variable.

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1 76. A kit for the collection of DNA from a subject comprising  
2 a sample collection substrate for collection of DNA from a subject thereon, said  
3 substrate having a first side and a second side.  
4 said substrate having a protective layer on said first side to prevent contamination of  
5 said first side, and  
6 a second protective layer for covering said substrate second side, said second  
7 protective connecting with said first protective layer to form a protective pouch for  
8 holding said substrate prior to use.

9 77. The kit as claimed in claim 76 wherein said holder containing said sample  
10 collection substrate is placed into a housing and said housing containing said substrate  
11 is exposed to an effective quantity of an agent for disabling DNA from interfering with  
12 subsequent specimen specific DNA analysis.

13 78. The kit as claimed in claim 77 wherein said agent comprises exposure to gamma  
14 radiation.

15 79. The kit as claimed in claim 77 wherein said agent comprises exposure to  
16 ethylene oxide.

17 80. The kit as claimed in claim 77 wherein said agent comprises exposure to an ion  
18 beam.

19 81. The kit as claimed in claim 77 wherein said agent comprises exposure to  
20 electron beam ionization.

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82. The kit as claimed in claim 76 wherein said substrate is comprised of material selected from the group consisting of Whatman FTA, S&S IsoCode, S&S 903, and S&S 900.

83. The kit as claimed in claim 76 wherein said sample substrate is comprised of material selected from the group consisting of Dacron, nylon, plastic, cotton and paper.

84. The kit as claimed in claim 76 wherein said sample substrate is comprised of an adhesive surface.

85. The kit as claimed in claim 84 wherein said adhesive strength of said adhesive surface are variable.

86 A device for the collection of DNA from a subject comprising:  
a sample collection substrate for collection of DNA from a subject thereon, said substrate having a first side and a second side.  
said substrate having a protective layer on said first side to limit contamination of said first side, and  
a second protective layer for covering said substrate second side, said second protective connecting with said first protective layer to form a protective pouch for holding said substrate prior to use.

87. The kit as claimed in claim 86 wherein said holder containing said sample collection substrate is placed into a housing and said housing containing said substrate is exposed to an effective quantity of an agent for disabling DNA from interfering with subsequent specimen specific DNA analysis.

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1 88. The kit as claimed in claim 87 wherein said agent comprises exposure to gamma  
2 radiation.

3 89. The kit as claimed in claim 87 wherein said agent comprises exposure to  
4 ethylene oxide.

5 90. The kit as claimed in claim 87 wherein said agent comprises exposure to an ion  
6 beam.

7 91. The kit as claimed in claim 87 wherein said agent comprises exposure to  
8 electron beam ionization.

9 92. The kit as claimed in claim 86 wherein said substrate is comprised of material  
10 selected from the group consisting of Whatman FTA, S&S IsoCode, S&S 903, and  
11 S&S 900.

12 93. The kit as claimed in claim 86 wherein said sample substrate is comprised of  
13 material selected from the group consisting of Dacron, nylon, plastic, cotton and paper.

14 94. The kit as claimed in claim 86 wherein said sample substrate is comprised of an  
15 adhesive surface.

16 95. The kit as claimed in claim 94 wherein said adhesive strength of said adhesive  
17 surface are variable.

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- 1 96. A method of collecting DNA-containing material from a subject comprising  
2 providing a sticky collection substrate,  
3 applying the fingerprint surface of the finger or thumb of the subject to said  
4 substrate, and  
5 allowing DNA-containing material from the fingerprint surface of the finger or  
6 thumb of the subject to adhere to said collection substrate.
- 7 97. A method of associating fingerprint evidence obtained from a subject with DNA  
8 evidence obtained from a subject comprising:  
9 providing a sticky collection substrate,  
10 applying a fingerprint surface of the finger or thumb of the subject to said  
11 substrate to generate a fingerprint of the subject in the substrate,  
12 allowing DNA-containing material from the fingerprint surface of the finger or  
13 thumb of the subject to adhere to said collection substrate, and  
14 recording an image of the generated fingerprint of the subject prior to use of the  
15 collection substrate for DNA analysis.

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1 98. A method of collecting fingerprint evidence from a subject and DNA evidence  
2 from a subject comprising:  
3 providing plurality of a sticky collection substrate portions,  
4 applying a fingerprint surface of a finger or thumb of the subject to a first  
5 collection substrate portion to generate a first fingerprint in said first  
6 substrate portion,  
7 reapplying said fingerprint surface of said finger or thumb to a second substrate  
8 portion to generate a second fingerprint in said second substrate portion,  
9 and  
10 using said one of said first or second fingerprints in said first or second substrate  
11 portions for analysis of DNA-containing material collected from said  
12 fingerprint surface.



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1 99. A method of avoiding prejudice of forensic specimen testing results at a forensic  
2 testing laboratory comprising:  
3 providing a specimen collection device, said device having a specimen collection  
4 portion and a subject information portion,  
5 obtaining a forensic specimen from a subject with said specimen collection portion,  
6 applying a first barcoded label to said specimen collection portion,  
7 applying a second barcoded label to said subject information portion, said second  
8 barcoded label having an identical barcode to said first barcoded label,  
9 transmitting said specimen collection portion with said first barcode to a laboratory for  
10 testing  
retaining said subject information portion.

11 100. The method as claimed in claim 100 wherein said forensic specimen is free DNA  
12 or DNA-containing material.

13 101. The method as claimed in claim 100 wherein said forensic specimen is a  
14 fingerprint or thumbprint.

15 102. The method as claimed in claim 100 wherein said forensic specimen is urine or  
16 other body fluid.  
17